An Experience Using LOINC™ in a Clinical Application

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Introduction

At 3M, we have incorporated the Voser[1] approach in the building of our Longitudinal Data Repository (LDR). To date, our Health Data Dictionary (HDD) contains clinical data categories such as laboratory tests and results, pharmacy items, and clinical problems and procedures, as well as non-clinical data categories used in patient encounters, such as race, insurance, and hospital services. As far as possible, we have used nationally recognized or well known sources as "starter sets" in populating our data dictionary. For instance, ICD9-CM is used for clinical problems, among other sources.

When a user health care organization implements the 3M LDR, the first step is to map the organization's codes to the concepts in the HDD. This step almost always results in the finding of concepts not contained in the HDD. These concepts would then be added to the HDD, enriching it.

In the area of laboratory tests and results, one of our "starter set" is LOINC™[2]. LOINC stands for Logical Observation Identifier Names and Codes (previously Laboratory Observation Identifier Names and Codes). In LOINC, laboratory results are named in a consistent and comprehensive manner, and each given a unique identity code. Note that we differentiate between a laboratory test and a laboratory result as follows: for instance, Serum Electrolytes is a test containing three results; Serum Sodium, Serum Potassium and Serum Chloride (these are not in LOINC name format for brevity and readability). Of course, there may also be a test Serum Sodium containing a single result, Serum Sodium. To date, LOINC only names results, not tests.

Findings

This poster describes our experience in mapping laboratory result codes from Promedica, a health care organization in Ohio, to the HDD. Three of our findings are briefly described here. Firstly, we found that a user site's consideration of laboratory result names tend to be less rigorous than that held to by LOINC, as expected. For instance, LOINC differentiated between Blood, Serum and Plasma as Specimen Types. However, Promedica tended to lump all under Blood. Thus, when Promedica's result name had Blood as Specimen and LOINC's had Serum, for example, a decision has to be made regarding mapping to LOINC or not. Secondly, there are a few results that could change their property based on the value of the result. For instance, if an antibody is not detected, the result would return "Negative", and thus the property of the result measured would be "Presence/Identity/Existence". However, if the antibody is detected, then a titer would be returned as the result, and thus the property measured would be "Titer". By LOINC, these would be two different result names. However, Promedica considered them the same and thus had only one code. Thirdly, we found that some laboratory result names could not fit the LOINC model. Obvious examples are those used in send-out tests (tests sent to an external laboratory), such as Date Sent, Date Back and Lab Sent To. Because these are not in the header portion of an HL7 transmission, they have to be regarded as a laboratory result. There were 28 of these types of result names from Promedica.

In summary, there were 756 codes from Promedica's ADAC laboratory information system. These mapped to 691 distinct laboratory result names, of which 348 were contained in LOINC version 1.0d (released 7/14/95). Of the remaining 343, three were contained in the new names added by LOINC version 1.0f (released 12/21/95). We plan to submit 315 laboratory result names to LOINC to be considered for inclusion in its future release.

References

1. Roberto A. Rocha, Stanley M. Huff, Peter J. Haug, Homer R. Warner. Designing a Controlled Medical Vocabulary Server: The VOSER Project. Computers and Biomedical Research, 27(6): 472-507, 1994.

2. Laboratory Observation Identifier Names and Codes (LOINC™) Users Guide v.1.0, obtained electronically from FTP/Gopher: dumccss.mc.duke.edu/standards/HL7/termcode/loinclab.